Space Weather Forecast

Issued on Saturday, 30 July 2022 at 13:05 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storm intervals days 1 and 2 (30th and 31st).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Very Low over the past 24 hours, with no significant flares. There are currently three sunspot regions on the visible disc, with the largest region in the southeast, which has seen some growth in its intermediate spots. The other two regions are small and simple.

A filament eruption (arc of plasma) seen to be lifting off in the southeast has produced a Coronal Mass Ejection (CME), although the bulk of this CME appears to be heading southwards, as seen in imagery. Further analysis is currently taking place to ascertain any potential Earth-directed component, but this is considered to be unlikely. Otherwise, no Earth-directed CMEs (coronal mass ejections) were observed.

Solar Wind / Geomagnetic Activity: Solar winds were predominantly at background levels, between 320-380 km/s. The magnetic field was mostly weak to moderate, with the all important north-south component, also weak. The resulting geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is likely to remain predominantly Very Low with only a slight chance of moderate-class X-ray flares.

Solar Wind / Geomagnetic Activity: No CMEs have been assessed as Earth-directed. Background winds initially, before the arrival of the fast wind from a small coronal hole day 1 (30th), perhaps into day 2 (31st). Solar winds likely gradually easing day 3 and 4 (1st and 2nd), but could see further enhancement as Earth encounters further fast winds originating from coronal holes close to the Suns south pole by the end of the period. Geomagnetic activity is forecast to be mainly Quiet with a chance of Unsettled intervals, then Unsettled with Active intervals with a slight chance of G1/Minor storm with the arrival of the fast winds day 1, perhaps into day 2 (30th and 31st). Activity easing back to Quiet to Unsettled thereafter, but with a slight chance of increasing to Active to G1/Minor Storm by the end of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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